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Chiggers (Acarina, Trombiculidae) from Vertebrates of the Yucatan Peninsula, Mexico

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BY

Richard B. Loomis

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The University of Kansas
1969

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(Continued on inside back cover)

Chiggers (Acarina, Trombiculidae) from Vertebrates of the Yucatan Peninsula, Mexico

BY

Richard B. Loomis

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Chiggers (Acarina, Trombiculidae) from Vertebrates of the Yucatan Peninsula, Mexico

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In the summer of 1962, the Museum of Natural History at The University of Kansas initiated a field program to survey the vertebrate fauna of the Yucatan Peninsula of Mexico—the states of Campeche and Yucatan and the territory of Quintana Roo. Two field parties were involved in the survey, one consisting of William E. Duellman and six students, and the second group of J. Knox Jones, Jr., and four students who were specifically working on Middle American terrestrial vertebrates and their ectoparasites. In addition, Percy L. Clifton, field collector for the Museum of Natural History worked in the area during the dry season of 1962-63.

Several publications deal with the vertebrates taken on the Yucatan Peninsula in 1962 and 1963. Duellman (1965) listed 96 species and subspecies of amphibians and reptiles based on 1744 specimens, and Klaas (1968) reported on 136 species of birds represented by 493 specimens taken in summer. Jones and Lawlor (1965) listed the mammals from Isla Cozumel and Lawlor (1965) discussed the distribution and variation of *Peromyscus yucatanicus*.

Only two previous publications listed trombiculid mites from the Yucatan Peninsula. Wharton (1938) reported three species of chiggers—*Trombicula camilla* Wharton, based on free-living adults from caves, and two species, *Hannemania nudosetosa* Wharton and *Trombicula myops* Vitzthum, recovered as larvae from bats. The species *H. nudosetosa* was subsequently designated as the type species of the genus *Whartonia*, whereas the larvae originally determined as *T. myops* apparently do not belong to that species. The only other reference to chiggers of the region was that of Jenkins (1949), who reported the common pest chigger, *Trombicula (Eutrombicula) alfreddugesi*.

The purpose of this paper is to report the larval trombiculids known from the Yucatan Peninsula. A total of 1077 larvae consisting of 26 species of chiggers are reported below, including a new species of *Euschoengastoides* and two new species of *Tecomatlana*. In addition, 21 species are reported from the Yucatan Peninsula for the first

time, and eight of these are new records from México: *Odontacarus cayolargoensis*, *Wagenaaria similis*, *Fonsecia gurneyi*, *Tecomatlana saccopteryx*, *Tecomatlana vesperuginis*, *Perissopalla lipoglena*, *Perissopalla precaria* and *Euschoengastia desmodus*. New combinations include the transfer of *Euschoengastia lipoglena* Brennan and Jones to the genus *Perissopalla* Brennan and White, and *Trombicula anophthalma* Hoffmann to the genus *Perates* Brennan and Dalmat.

Acknowledgments

Most of the vertebrates and their larval chiggers were taken by two field parties. The group headed by J. Knox Jones, Jr., was supported by the United States Army Medical Research and Development Command (contract no. DA-49-193-MD-2215). The group directed by William E. Duellman was supported in part by the Museum of Natural History and in part by a grant from the National Science Foundation (G 20939, Special Projects in Science Education). Slide preparations and taxonomic studies of the chiggers were supported by Research Grant AI 03407 from the National Institute of Allergy and Infectious Diseases to California State College at Long Beach, Richard B. Loomis, Principal Investigator.

I am indebted to these other persons who obtained vertebrates and their chiggers: Ticul Alvarez, A. B. Amerson, Jr., Percy L. Clifton, William E. Duellman, Richard C. Fox, J. Knox Jones, Jr., Erwin E. Klaas, Thomas E. Lovejoy III, Jack G. Makepeace, Dwight R. Platt, William C. Stanley, Jerome B. Tulecke, and John Wellman. The amphibians and reptiles were identified by W. E. Duellman (1965), the birds by E. E. Klaas (1968), and the mammals by J. Knox Jones, Jr. In addition, I am grateful to Julius C. Geest for identifications of *Pseudoschoengastia*, James L. Lucas for the determination of *Leptotrombidium panamense*, James P. Webb, Jr., for measurements of selected larvae, and Elaine Katzer for the excellent illustrations.

Explanation of Species Accounts

The genera and species of chiggers are arranged alphabetically under the two subfamilies. Terminology usually follows that of Wharton *et al.* (1951). All measurements are in microns. The description of the larval stage of each new species is based upon the holotype, supplemented by additional information from the type series.

The larvae examined are arranged alphabetically by state or territory and locality; date (1962 unless otherwise noted); and host species, preceded by the number of individuals with chiggers and followed by the number of larvae examined (in parentheses). The hosts are listed alphabetically by major groups as arranged in the host list. Only the genus and species of the host are listed in the accounts of chiggers, although subspecific determination, when known, is given in the host-chigger list.

Both Duellman (1965) and Klaas (1968) provided a map and a gazetteer giving details of the collecting localities, including latitude and longitude, elevation, and type of vegetation.

All larvae listed are in the chigger research collection at California State College, Long Beach. Representatives of most species will be presented to the

following: Snow Entomological Museum, The University of Kansas; Rocky Mountain Laboratory, Hamilton, Montana; United States National Museum, Washington, D.C.; Los Angeles County Museum of Natural History; G. W. Hooper Foundation, The University of California Medical Center, San Francisco; Dr. Anita Hoffmann, National Polytechnic Institute, México; and to other appropriate institutions and individuals.

Accounts of Species

Family Trombiculidae

Subfamily Leeuwenhoekinae

Odontacarus cayolargoensis Brennan

Campeche.—5 km. S Champotón, 10-11 July, 2 *Heteromys gaumeri* (9).

Yucatan.—Chichén-Itzá, 22-23 July, *Ototylomys phyllotis* (2), *Peromyscus yucatanicus* (7), *Sigmodon hispidus* (8); Pisté, 24-26 July, 3 *Heteromys gaumeri* (8).

These are the first larvae of this species to be reported from México, approximately 950 kilometers southwest of the type locality, Key Largo, Florida. The type host, *Sigmodon hispidus,* also is one of the hosts herein reported from Yucatán.

These larvae are similar to the description and a paratype of *O. cayolargoensis.* There is a microgenuala distal to genuala II, which is not figured or mentioned in the original description (Brennan, 1959).

Odontacarus chiapanensis (Hoffmann)

Quintana Roo.—4 km. NNE Felipe Carrillo Puerto, 17 August, *Ototylomys phyllotis* (5); Pueblo Nuevo X-Can, 28 July, *Peromyscus yucantanicus* (2).

Larvae of this species, originally described from Chiapas, were not taken at any localities where *O. cayolargoensis* was recorded, although they were found on two of the same host species.

Wagenaaria similis Brennan

Campeche.—13 km. W, 1 km. N Escárcega, 16 July, *Pteronotus davyi* (3).

This is the second report of this recently described genus and species (Brennan, 1967). The type series is from a bat, *Mormoops megalophylla,* that was taken on the island of Curacao, approximately 2500 kilometers southeast of Escárcega. Characteristics of the three larvae closely approach those described for the holotype and those of two examined paratypes.

Whartonia guerrerensis Hoffmann

Campeche.—13 km. W, 1 km. N Escárcega, 16 July, 2 *Mormoops megalophylla* (6).

Although known from Guerrero, México, to Trinidad, this is the first record from the Yucatan Peninsula.

Whartonia nudosetosa (Wharton)

Quintana Roo.—Pueblo Nuevo X-Can, 28-29 July, *Carollia perspicillata* (2), *Peropteryx macrotis* (1).

Yucatan.—Gruta de Balankanche, 5 km. E Chichén-Itzá, 23-24 July, *Artibeus jamaicensis* (1), *Desmodus rotundus* (1); 6 km. S Mérida, 19 August, *Glossophaga soricina* (7); Pisté, 22 July, *Mimon cozumelae* (1).

Wharton (1938) described this species from larvae taken off *Artibeus jamaicensis* and *Peropteryx macrotis* (originally listed as *Peteropteryx canina canina*) from a cave near Oxkutzcab, Yucatán. The four additional bat species listed above are new host records.

Subfamily Trombiculinae

Cordiseta mexicana (Hoffmann)

Campeche.—5 km. S. Champotón, 11 July, *Heteromys gaumeri* (1); 7.5 km. W Escárcega, 14 July, *Heteromys gaumeri* (4).

Quintana Roo.—Pueblo Nuevo X-Can, 28 July, *Peromyscus yucatanicus* (1).

The monotypic genus *Cordiseta* is considered most closely related to species of the genus *Pseudoschoengastia*, subgenus *Walchioides*. Species of the two taxa possess virtually the same larval characteristics, except for the conspicuous large, flattened, foliate, dorsal body setae and five prongs on the palpotibial claw in *Cordiseta*. Geest and Loomis (1968:11-12) commented on the characteristics of *Cordiseta* and *Pseudoschoengastia*.

The single larva from Quintana Roo is referred tentatively to this species, although it differs in several characteristics from the Campeche specimens and from an examined paratype of *C. mexicana*.

Ectonyx fusicornis Brennan

Yucatan.—3 km. N Pisté, 25 July, *Heteromys gaumeri* (1).

The single larva is similar to *E. fusicornis* except that each of the six tarsi has only two long, claw-like structures, one stout and the other slender. On several tarsi a small spur or stump can be seen, which may be the base of a broken claw.

Euschoengastia desmodus Brennan and Dalmat

Yucatan.—Gruta de Balankanche, 5 km. E Chichén-Itzá, 24 July, *Glossophaga soricina* (1); 6 km. S Mérida, 18 August, *Glossophaga soricina* (1); Pisté, 22 July, *Mimon cozumelae* (7).

Although here retained in the original genus, *E. desmodus* does not belong to *Euschoengastia*. It is allied to the North American species *Trombicula univari* Brennan and *Trombicula sprocssi* Brennan, also parasitic on bats, and all three species belong to an unnamed genus.

Euschoengastoides wadei, new species

(Figure 1)

Types.—Holotype and 20 paratopotypes from 7.5 km. W Escárcega, 65 m., Campeche, México, from *Ototylomys phyllotis* (KU 92352), original number TA 693, taken on 15 July 1962 by Ticul Alvarez; one paratype from 2 km. N Pisté, 12 m., Yucátan, from *Ototylomys phyllotis* (KU 92307), original number WCS 470, taken on 21 July 1962 by W. C. Stanley.

Diagnosis.—Larva, similar to *Euschoengastoides loomisi* (Crossley and Lipovsky) in having three genualae I, dagger-shaped microgenuala I and microtibiala I, and sensilla subcapitate; differing from *E. loomisi* in having galeala branched.

Description of holotype.—Body engorged, 380 by 280, eyes 2/2, posterior larger, ocular plate present; dorsal setal formula 4-12-8-8-8-6-2, total 48±; measurements of humeral seta 37, seta of first posthumeral row 33, and posterior dorsal seta 25; ventral seta formula 2-2 + 20 (preanal) + 24 (postanal), total 44; measurements of first sternal seta 28, posterior ventral seta 23.

Scutum: Shape roughly rectangular, margins sinuous, SB roughly between AL's and PL's, sensilla expanded, setules present, but with nude ventral area (Fig. 1).

Scutal measurements of holotype and (in parentheses) the mean and extremes of six types, unless otherwise noted: AW, 60 (59, 56-65); PW, 71 (69, 66-72); SB, 21 (19, 17-21); ASB, 20 (21, 19-23); PSB, 12 (12.5, 12-13); AP, 20 (21, 20-22); AM, 32 (32, 24-36); AL, 24 (27, 24-30); PL, 44 (42, 38-44); S, 37/13 (36.5, 36-37, 2 specimens).

Gnathosoma: Cheliceral blade with tricuspid cap and ventral tooth, cheliceral base and capitular sternum punctate; galeala branched (3 to 4 branches); palpal setal formula B/B/BNB; palpotarsus with four branched setae and tarsala 8 μ; palpotibial claw with three prongs, large axial prong with smaller accessory prongs.

Legs with specialized setae as follows: leg I with three genualae and dagger-shaped microgenuala, two tibialae and microtibiala, tarsala 14 μ, microtarsala, subterminala, parasubterminala, and pretarsala; leg II with genuala, tibiala, tarsala 15 μ, microtarsala, and pretarsala; leg III having coxa with one branched seta, genuala, tibiala, tarsus with mastisetae; all legs with segments 7-7-7, but femora II and III partly fused, and terminating in two claws and a claw-like empodium without onychotriches.

Leg index (holotype, mean and extremes of six types): I, 217 (213, 198-231); II, 181 (197, 181-222); III, 213 (218, 209-227); total, 611 (629, 609-680).

Remarks.—This species is named in honor of Professor Otis Wade, formerly Professor of Zoology at the University of Nebraska, my friend and teacher, who was responsible for my entry into the study of chiggers.

Eutrombicula alfreddugesi (Oudemans)

Campeche.—5 km. SW Champotón, 10-11 July, 2 *Basiliscus vittatus* (16); 6 km. W Escárcega, 13 July, *Ameiva undulata* (8); 7.5 km. W Escárcega, 14-16

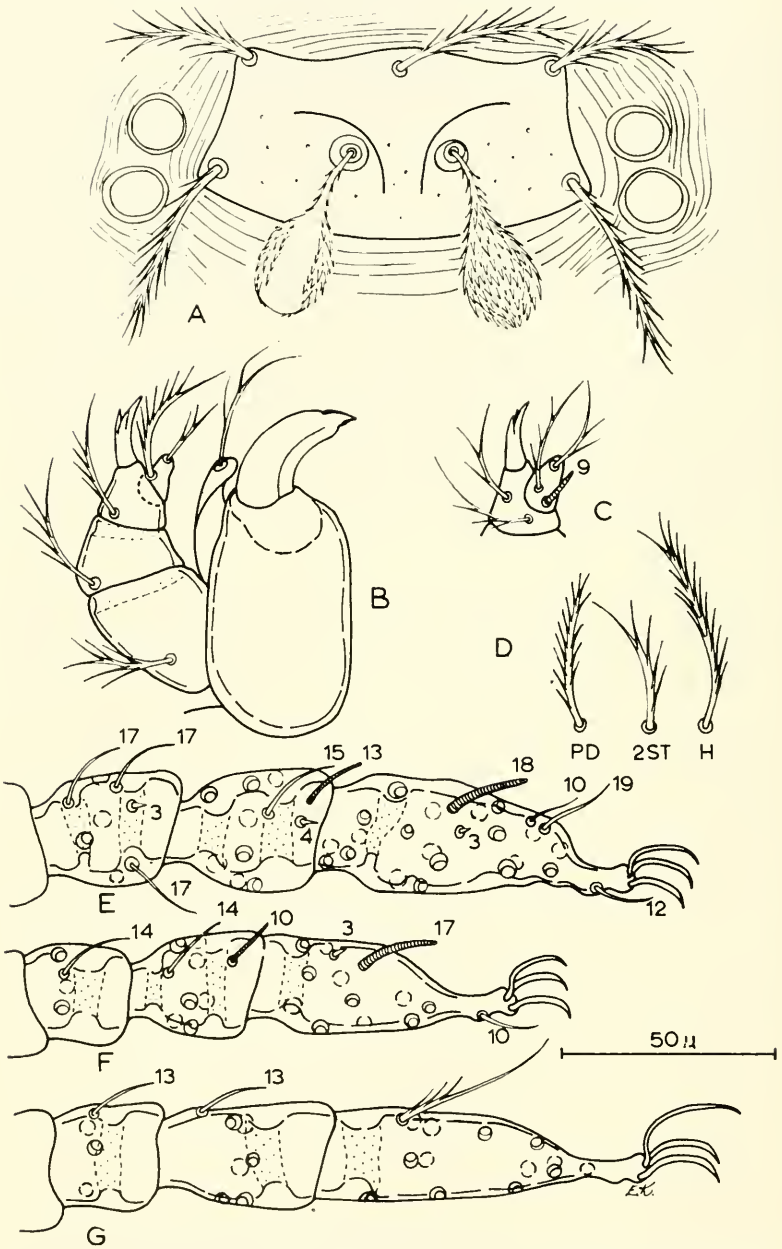

FIG. 1. *Euschoengastoides wadei*, new species. A, scutum and eyes; B, dorsal aspect of gnathosoma; C, ventral aspect of palpotibia and tarsus; D, body setae—posterior dorsal (PD), second sternal (2St), humeral (H); E, leg I, three distal segments, showing nude setae, with measurements in microns, and bases of branched setae; F, leg II, as above; G, leg III, as above.

July, *Ameiva undulata* (8), *Anolis lemurinus* (9), *Leptophis mexicanus* (4), 2 *Oryzomys melanotis* (11), *Ototylomys phyllotis* (1), *Piaya cayana* (1), *Rhamphocaenus rufiventris* (8), *Sciurus deppei* (8), *Sciurus yucatanensis* (27), 2 *Sigmodon hispidus* (11); 13 km. W, 1 km. N Escárcega, 16 July, *Ciccaba virgata* (11); 103 km. SE Escárcega, 7 June 1963, *Sigmodon hispidus* (2).

QUINTANA ROO.—4 km. NNE Felipe Carrillo Puerto, 14-17 August, 3 *Ameiva undulata* (26), *Dendrocincla homochroa* (3), 3 *Oryzomys melanotis* (15), *Ototylomys phyllotis* (3), *Psilorhinus morio* (6), *Sciurus deppei* (8), *Sciurus yucatanensis* (8); Isla Mujeres, 2 August, *Ameiva undulata* (4), 2 *Sceloporus chrysostictus* (8); Pueblo Nuevo X-Can, 27-30 July, *Anolis limifrons* (2), 2 *Ameiva undulata* (12), *Basiliscus vittatus* (8), *Cnemidophorus angusticeps* (6), *Glaucidium brasilianum* (12), *Nasua narica* (6), *Ototylomys phyllotis* (1), 2 *Sceloporus chrysostictus* (17), 2 *Sciurus yucatanensis* (14); 6.7-8 km. W Puerto Juárez, 31 July, 2 *Elaphe flavirufa* (7), *Spilotes pullatus* (8).

YUCATAN.—Chichén-Itzá, 27 July, *Otonyctomys hatti* (3); 2 km. E Chichén-Itzá, 22 July, *Oryzomys melanotis* (1); Pisté, 21-26 July, 3 *Ameiva undulata* (24), 2 *Cyanocorax yncas* (8), *Marmosa canescens* (8), *Peromyscus yucatanicus* (1), *Rattus rattus* (10).

All of these larvae are tentatively assigned to *E. alfreddugesi* although there are certain differences among the specimens. This pest chigger has been reported previously from Chichén-Itzá by Jenkins (1949), who stated that it is called "aradores" in Yucatán.

E. alfreddugesi was the chigger most frequently taken on the peninsula. The reptiles, represented by 21 lizards of six species and four snakes of three species, were parasitized by no other chigger. Lizards, especially species of *Ameiva, Cnemidophorus,* and *Sceloporus,* were heavily infested, and probably represented the major hosts wherever they were common. In addition, eight of 10 birds (seven species) from which chiggers were collected and 23 of 81 terrestrial mammals (10 species) were hosts for these larvae. Thus 56 hosts representing 26 species were parasitized by *E. alfreddugesi,* the most widespread and abundant chigger of the Yucatan region.

Eutrombicula batatas (Linnaeus)

YUCATAN.—3 km. N Pisté, 26 July, *Sigmodon hispidus* (1)

Although widespread in the American tropics, this pest chigger has not been reported previously from the Yucatan Peninsula.

Fonsecia (Parasecia) gurneyi (Ewing)

CAMPECHE.—5 km. S Champotón, 11 July, *Ototylomys phyllotis* (1); 7.5 km. W Escárcega, 14-16 July, 6 *Heteromys gaumeri* (35), *Ortalis vetula* (1), *Peromyscus leucopus* (3).

YUCATAN.—Chichén-Itzá, 23 July, *Peromyscus yucatanicus* (1); 3 km. N Pisté, 26 July, *Peromyscus leucopus* (8).

Scutal measurements of 13 specimens, unless otherwise noted: AW, 57 (53-61); PW, 69 (64-74); SB, 28 (26-30); ASB, 23.5 (20-26); PSB, 17 (15-18); AP, 16 (14-18); AM, 35 (32-40); AL, 21 (18-26); PL, 39 (35-47); S, 51, 59 (2 specimens).

These specimens closely resemble *Fonsecia gurneyi* in all major characteristics (Loomis, 1955). The length of the AM seta closely approaches the condition in *Fonsecia gurneyi campestris* (Loomis), but these larvae are not assigned to a subspecies. For the use of the generic and subgeneric names, see Loomis (1966).

Hoffmannina suriana (Hoffmann)

Campeche.—7.5 km. W Escárcega, 14-16 July, *Peromyscus leucopus* (2), *Peromyscus yucatanicus* (2), *Sciurus yucatanensis* (1).

Larvae of this species normally have two PL setae on each side of the scutum. However, among these five larvae only two have 2-2 PL's whereas two larvae have two PL's on one side and one PL on the other and one larva, although possibly incomplete as it has a broken scutal plate, seems to have only one PL on each side. These larvae are similar in all other characteristics, including the prominent dermal striae of the body.

Leptotrombidium (Leptotrombidium) panamense (Ewing)

Campeche.—5 km. S Champotón, 8-10 July, *Heteromys gaumeri* (6), 2 *Ototylomys phyllotis* (16); 7.5 km. W Escárcega, 15 July, *Columba flavirostris* (3), *Sigmodon hispidus* (4); 65 km. S, 128 km. E Escárcega, 25 February 1963, *Ototylomys phylotis* (8); 103 km. SE Escárcega, 7-13 June 1963, *Orthogeomys hispidus* (15), *Sigmodon hispidus* (14).

Quintana Roo.—4 km. NNE Felipe Carrillo Puerto, 17 August, *Heteromys gaumeri* (1), *Ototylomys phyllotis* (1).

Yucatan.—2 km. E Chichén-Itzá, 27 July, *Ototylomys phyllotis* (1); 66 km. NE Mérida, 22 April 1963, *Ototylomys phyllotis* (11); Peto, 17 April 1963, *Heteromys gaumeri* (6); 2-3 km. N Pisté, 21-26 July, 4 *Ototylomys phyllotis* (6).

This is the first species of *Leptotrombidium* to be reported from the Yucatan Peninsula. The larvae seem to occur on hosts throughout the year, although most larvae were taken in July.

Perates anophthalma (Hoffmann), new combination

Yucatan.—Gruta de Balankanche, 5 km. E Chichén-Itzá, 23 July, 5 *Desmodus rotundus* (16).

This species, which occurs regularly on tropical American bats, has been difficult to place generically. Vercammen-Grandjean (1968) placed it in the subgenus *Perates* Brennan and Dalmat (1960), which he believed belonged in the genus *Myotrombicula* Womersley and Heaslip. However, *Myotrombicula* appears to be largely if not entirely Old World, whereas *Perates* is New World in distribution, and the numerous differences seem to warrant separate generic status for the two taxa. *P. anophthalma* was originally described in the genus *Trombicula* (Hoffmann, 1960:102).

Perissopalla lipoglena (Brennan and Jones), new combination

Campeche.—13 km. W, 1 km. N Escárcega, 16 July, *Mormoops megalophylla* (1).

Yucatan.—Gruta de Balankanche, 5 km. E Chichén-Itzá, 24 July, *Mormoops megalophylla* (6).

This species was described (as *Euschoengastia lipoglena* Brennan and Jones, 1960:504-506) from a single larva found on *Mormoops megalophylla* in Trinidad. The above specimens agree with the holotype and the original description except that these larvae lack the sensilla.

Examination of available larvae, including series from Sonora and Sinaloa, México, revealed that this species belongs to the genus *Perissopalla.* It agrees with *Perissopalla flagellisctula* Brennan and White (1960) and *P. precaria* (Brennan and Dalmat, 1960) in most characteristics, including the type of sensilla; general shape of scutum; the number and position of nude setae on the legs, especially the tiny microtarsala 1, which is in a pit. However, *Perissopalla lipoglena* is eyeless and the palpotarsus has five branched setae but lacks a subterminala, whereas the other two species have 2/2 eyes and the palpotarsal setal formula is 5 B.S. The species of *Perissopalla* are parasitic on bats.

Perissopalla precaria (Brennan and Dalmat)

Quintana Roo.—4 km. NNE Felipe Carrillo Puerto, 16 August, *Glossophaga soricina* (5).

These larvae seem to be typical of the species. All lack the sensilla.

Pseudoschoengastia (Pseudoschoengastia) brennani Hoffmann

Campeche.—7 km. N, 51 km. E Escárcega, 19 December, *Peromyscus yucatanicus* (1).

Quintana Roo.—Pueblo Nuevo X-Can, 28 July, *Peromyscus yucatanicus* (13).

Yucatan.—6 km. S Mérida, 18 August, *Peromyscus yucatanicus* (2); 66 km. NE Mérida, 22 April 1963, *Ototylomys phyllotis* (1); 3 km. N Pisté, 26 July, *Peromyscus yucatanicus* (31).

Geest and Loomis (1968:31) placed this species in the *anomala* group. Hoffmann (1960) reported larvae from Chiapas from several species of *Peromyscus,* which seems to be the preferred host genus. The palpogenual seta is branched on *P. brennani,* and nude on *P. extrinseca* and *P. scitula.*

Pseudoschoengastia (Pseudoschoengastia) extrinseca Brennan

Campeche.—5 km. S Champotón, 10 July, *Heteromys gaumeri* (2); 7.5 km. W Escárcega, 14-16 July, 7 *Heteromys gaumeri* (19); 65 km. S, 128 km. E Escárcega, 25 February 1963, *Ototylomys phyllotis* (1).

Quintana Roo.—4 km. NNE Felipe Carrillo Puerto, 14-17 August, 2 *Heteromys gaumeri* (5), 2 *Ototylomys phyllotis* (4).

Yucatan.—2 km. E Chichén-Itzá, 27 July, *Ototylomys phyllotis* (4); Pisté, 21-26 July, 2 *Heteromys gaumeri* (6), 5 *Ototylomys phyllotis* (16).

Geest and Loomis (1968:31) placed *P. extrinseca* in the *anomala* group of the subgenus *Pseudoschoengastia. Pseudoschoengastia extrinseca* and *P. brennani* were not taken at the same locality and except for one larva of *P. brennani* on *Ototylomys,* a regular host for *P. extrinseca,* they were not found on the same host species.

Pseudoschoengastia (Pseudoschoengastia) scitula Brennan and Jones

Campeche.—5 km. S Champotón, 11 July, *Ototylomys phyllotis* (8); 7.5 km. W Escárcega, 14-16 July, 7 *Heteromys gaumeri* (19), 2 *Oryzomys melanotis* (2), *Ototylomys phyllotis* (19), *Peromyscus leucopus* (1), *Sigmodon hispidus* (1); 7 km. N, 51 km. E Escárcega, 19 December, *Heteromys gaumeri* (16); 65 km. S, 128 km. E Escárcega, 25 February 1963, *Ototylomys phyllotis* (7); 103 km. SE Escárcega, 9-13 June 1963, *Orthogeomys hispidus* (1), *Heteromys gaumeri* (16), *Ototylomys phyllotis* (7).

Quintana Roo.—85 km. W Chetumal, 4 March 1963, *Heteromys gaumeri* (5), *Ototylomys phyllotis* (16); 4 km. NNE Felipe Carrillo Puerto, 14-17 August, 3 *Heteromys gaumeri* (18); *Oryzomys melanotis* (2), 2 *Ototylomys phyllotis* (19); Pueblo Nuevo X-Can, 28 July, 3 *Ototylomys phyllotis* (23).

Yucatan.—Chichén-Itzá, 23-27 July, 2 *Ototylomys phyllotis* (6); Peto, 17 April 1963, *Heteromys gaumeri* (2); 2-3 km. N Pisté, 21-26 July, 6 *Heteromys gaumeri* (4), 6 *Ototylomys phyllotis* (33).

Geest and Loomis (1968:23) placed this species in the *farneri* group. The holotype and only previously known specimen was taken from *Liomys pictus isthmius* in Chiapas. This chigger can be separated from *P. extrinseca* by the shape of the scutum and by the branched palpodorsotibial seta in the latter. Larvae of both *P. extrinseca* and *P. scitula* were recovered from the same host on 19 occasions in the material here reported.

Pseudoschoengastia (Walchioides) gouldi (Hoffmann)

Campeche.—7.5 km. W Escárcega, 15 July, *Ototylomys phyllotis* (1).

This is the second locality of record for *P. gouldi*, which was described from four larvae taken in Chiapas. It agrees with the type series in most characteristics: palpal setal formula B/B/BNB; galeala N; scutal measurements—AW 41, PW 54, SB 18, ASB 18, PSB 11, AP 24, AL 20, PL 31, S 27, width 12; AM seta and setal base absent.

Geest and Loomis (1968) recognized *Walchioides* Vercammen-Grandjean (type species *Walchia gouldi* Hoffmann) as a subgenus of the genus *Pseudoschoengastia*, for those species that have the PL's on the scutum.

Speleocola secunda Brennan and Jones

Campeche.—7 km. N, 51 km. E Escárcega, 19 December, *Peromyscus yucatanicus* (85).

Yucatan.—6 km. S Mérida, 18 August, *Peromyscus yucatanicus* (8); 3 km. N Pisté, 26 July, *Peromyscus yucatanicus* (2).

The presence of larvae on white-footed mice and their absence from bats was unexpected because the type series of this chigger was from a bat (*Micronycteris*) taken on the island of Trinidad. This is the first report from the Yucatan Peninsula and from *Peromyscus*. The 95 larvae are similar except that there are two size groups. The 10 larvae from Yucatán and 59 of the 85 larvae from Campeche have shorter legs and shorter setae, especially tarsalae I, II, and the scutal setae (AL, AM, PL). The other 26 larvae from Campeche have longer legs and setae, which are extremely close in measurements and other

features to those given for S. *secunda* (Brennan and Jones, 1960). Since larvae of both size groups were taken off the same individual host and no other differences could be discerned, all of the above larvae are considered to be *Speleocola secunda*. Studies are underway to determine the status of these and other larvae of the genus *Speleocola*.

Tecomatlana alvarezi, new species
(Figure 2)

Types.—Holotype and eight paratopotypes from Cruta de Balankanche, 5 km. E Chichén-Itzá, Yucatán, México; holotype and seven paratopotypes from *Myotis nigricans* (KU 91906), original number TA 757, taken on 25 July 1962 by Ticul Alvarez; one paratopotype from *Natalus stramineus,* taken on 23 July 1962 by W. C. Stanley.

Diagnosis.—Larva, similar to *Tecomatlana texana* (Loomis and Crossley), *T. spinirostris* Vercammen-Grandjean, *T. vesperuginis*, and *T. yucatanica* in having three genualae I, palpal femur with lateral projection, cheliceral blade having small cap with few serrations, PL setae on scutum, and palpal tarsus 7 B.S.; differing from them in having PL setae forward, close to AL's, three prongs on palpotibial claw, galeala nude, eyes 0/0, with mastitarsala III, and body setae beginning 2-12-12.

Description of holotype.—Body engorged, 500 by 470, eyes absent; dorsal setal formula 2-13-12-10-8-4, total 50; measurements of humeral seta 53, seta of first posthumeral row 53, posterior dorsal seta 40; ventral setal formula 2-2+22 (preanal) + 32 (postanal), total 58; measurements of first sternal seta 43, second sternal seta 46, posterior ventral seta 33.

Scutum: AL and PL seta close together, SB posterior to line between PL's, scattered puncta, sensilla unknown (see Fig. 2A).

Scutal measurements of holotype, and (in parentheses) the mean and extremes of eight types, unless otherwise noted: AW, 71 (74, 71-82, 5 specimens); PW, 74 (79, 74-86, 5 specimens); SB, 24 (27, 24-31, 7 specimens); ASB, 23 (22, 20-24, 7 specimens); PSB, 16 (18, 16-20, 7 specimens); AP, 12 (10, 8-12, 6 specimens); AM, 56 (56, 46-65, 6 specimens); AL, 30 (31, 30-36, 6 specimens); PL, 53 (52, 49-56); S, —.

Gnathosoma: Cheliceral blade with prominent tricuspid cap, serrations not seen, cheliceral base and capitular sternum punctate; galeala nude; palpal setal formula B/B/BBN; palpal tarsus with seven branched setae, subterminala and tarsala, 12; palpotibial claw trifurcate with stout axial prong.

Legs with specialized setae as follows: leg I with three genualae and microgenuala, two tibialae and microtibiala, tarsala, 34 (39, 39-41), microtarsala, subterminala, parasubterminala and pretarsala; leg II, with genuala, tibiala, tarsala 26 (25, 23-27), microtarsala and pretarsala; leg III, coxa with one branched seta, genuala, tibiala, and mastitarsala; all legs with segments 7-7-7 and terminating in two claws and a claw-like empodium without onychotriches.

Leg index (holotype, mean and extremes of eight types): I, 262 (280, 245-310); II, 239 (252, 230-268); III, 254 (288, 254-314); total 755 (820, 748-875).

Remarks.—This species is named for Sr. Ticul Alvarez of the National Polytechnic Institute, Mexico City, for his excellent contributions to the study of

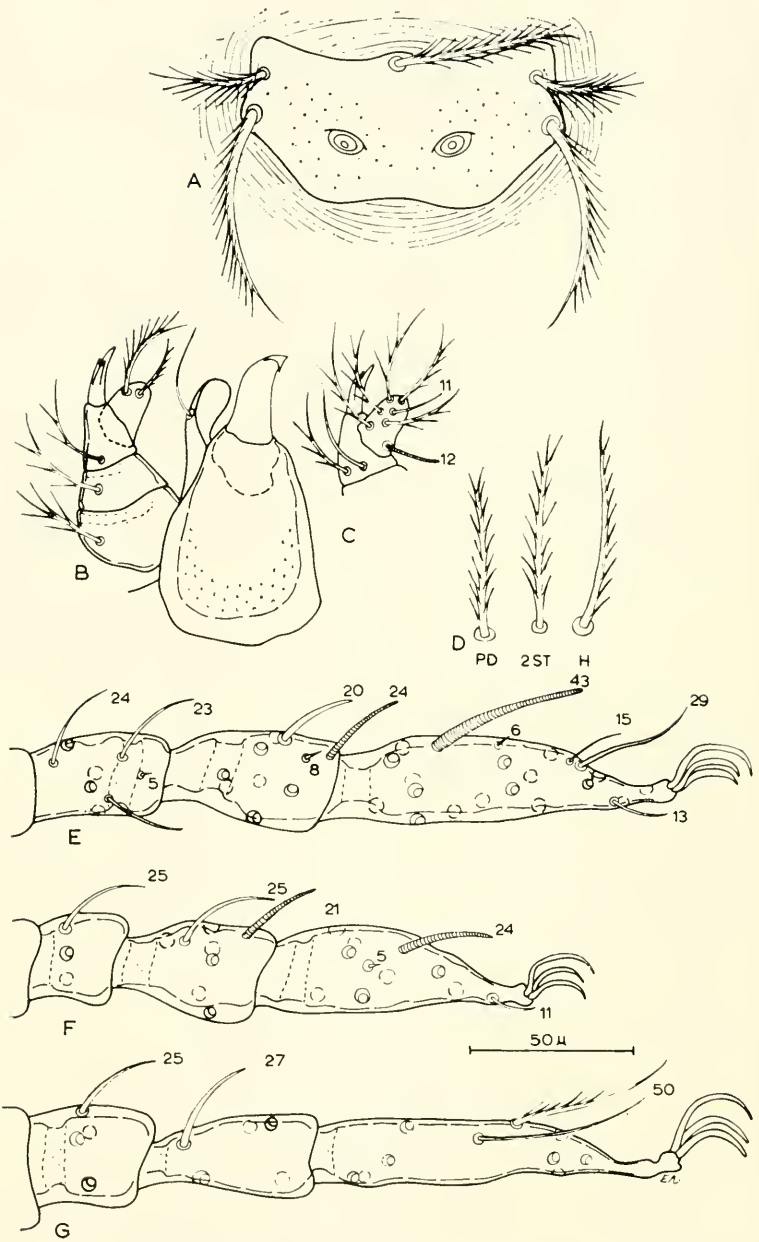

FIG. 2. *Tecomatlana alvarezi*, new species. A, scutum; B, dorsal aspect of gnathosoma; C, ventral aspect of palpotibia and tarsus; D, body setae—posterior dorsal (PD), second sternal (2 St), humeral (H); E, leg I, three distal segments, showing nude setae, with measurements in microns, and bases of branched setae; F, leg II, as above; G, leg III, as above.

Mexican vertebrate zoology and for collecting this and numerous other species of chiggers.

The placement of this species in the genus *Tecomatlana* is tentative. It seems to have most of the characteristics of that genus. However, the shape of scutum differs from that of other species and the sensilla is unknown.

Tecomatlana (Hooperella) saccopteryx (Brennan and Jones)

Campeche.—13 km. W, 1 km. N Escárcega, 16 July, *Saccopteryx bilineata* (24).

This species has not been reported previously from México. It was described from the island of Trinidad and additional records are from Colombia, Perú, and Panamá, off *Saccopteryx bilineata*. Vercammen-Grandjean (1967) placed it in the genus *Tecomatlana*, subgenus *Hooperella*.

Tecomatlana (Hooperella) vesperuginis (Brennan and Jones)

Yucatan.—Pisté, 20 July, 2 *Artibeus jamaicensis* (6).

This is the first report of *T. vesperuginis* in México; the species was known previously from Trinidad (Brennan and Jones, 1960) and Panamá (Brennan and Yunker, 1966).

Tecomatlana (Hooperella) yucatanica, new species
(Figure 3)

Types.—Holotype and 10 paratopotypes from Uxmal, Yucatán, México, taken on 20 August 1962 from *Tadarida laticaudata* (KU 92019-20, 92023), original numbers ABA 155 (four larvae), 156 (two larvae), 159 (one larva), and 162 (four larvae, including holotype) by A. Binion Amerson, Jr.

Diagnosis.—Larva, similar to *Tecomatlana acutascuta* (Brennan), *T. subacutascuta* Vercammen-Grandjean, *T. texana*, *T. vesperuginis*, and *T. spinirostris* in having three genualae I, PL's on scutum, cheliceral blade with serrated cap, palpotarsus with 7 B.S., sensilla flagelliform, palpofemur and genu with branched setae; differing from them in having several internal rings in tarsi, scutum without posteromedian projection, palpotibial claw with five prongs, galeala branched, palpal segments without lateral projections.

Description of holotype.—Body engorged, 650 by 400, color in life unknown; eyes 2/2, anterior larger, posterior faint, ocular plate present, color in life probably red; dorsal setal formula 2-9-6-6-6-8-6-6-6-4-4+22, total 85; measurements of humeral seta 43, seta of first posthumeral row 33, and posterior dorsal seta 30; ventral setal formula 2-2-6-6-4-4-4-4-4-4, total 40; measurements of first sternal seta 40, second sternal seta 34, and posterior ventral seta 28.

Scutum: Shape roughly rectangular, numerous large puncta, sensillary base near midpoint, sensilla with several terminal branches.

Scutal measurements of holotype and (in parentheses) the mean and extremes of 10 types: AW, 65 (65, 60-72); PW, 87 (87, 84-95); SB, 32 (31.5, 30-35); ASB, 27 (27, 24-28); PSB, 19 (21, 17-29); AP, 32 (31, 26-35); AM, 37 (42, 37-48); AL, 35 (35, 32-39); PL, 38 (37, 35-39); S, 87 (91, 85-102).

Gnathosoma: Cheliceral blade with serrated cap, cheliceral base and capitular sternum strongly punctate; galeala branched; palpal setal formula B/B/NNB;

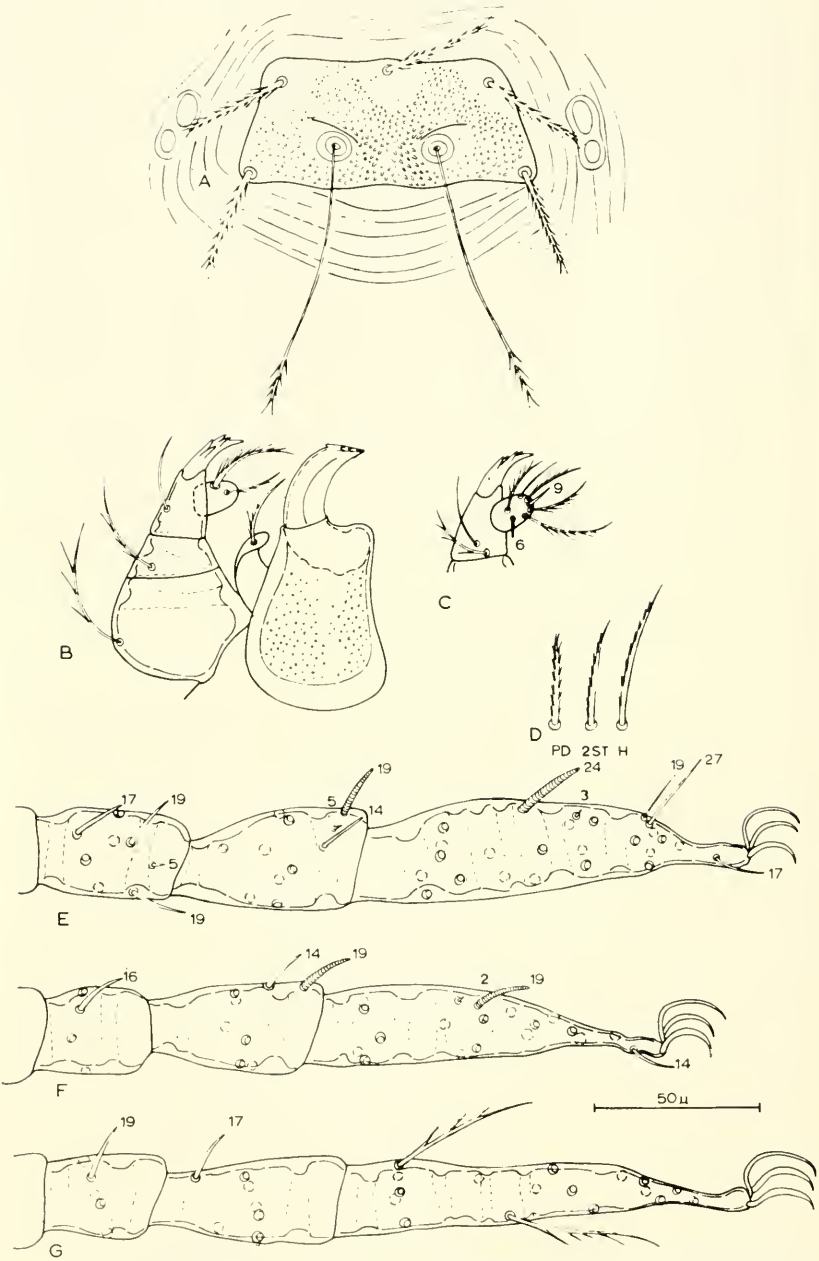

Fig. 3. *Tecomatlana yucatanica,* new species. A, scutum and eyes; B, dorsal aspect of gnathosoma; C, ventral aspect of palpotibia and tarsus; D, body setae—posterior dorsal (PD), second sternal (2St), humeral (H); E, leg I, three distal segments, showing nude setae, with measurements in microns, and bases of branched setae; F, leg II, as above; G, leg III, as above.

palpal tarsus with seven branched setae, subterminala, and tarsala; palpotibial claw with five prongs.

Legs with specialized setae as follows: leg I, with three genualae and microgenuala, two tibialae and microtibiala, tarsula, 23 (24, 22-26), distal microtarsala, subterminala, parasubterminala, and pretarsala; leg II, with genuala, two tibialae, tarsala 20 (19, 17-21), microtarsala, and pretarsala; leg III, coxa with one branched seta, genuala, tibiala, tarsus without nude mastisetae; all legs 7-7-7 with segments punctate and terminating in two claws and a claw-like empodium without onychotriches.

Leg index (holotype, means and extremes of 10 types): I, 413 (403, 345-423); II, 368 (360, 300-330); III, 378 (389, 362-412); total, 1159 (1152, 1063-1225).

Remarks.—Jones and Alvarez (1962) discussed the taxonomic status of the host free-tailed bat, *Tadarida laticaudata yucatanica* (Miller), a subspecies known from the Yucatan Peninsula eastward to Panamá. The specific name of the chigger refers to the host taxon and the type locality.

Tecomatlana (Tecomatlana) sandovali Hoffmann

QUINTANA ROO.—Pueblo Nuevo X-Can, 29 July, 2 *Peropteryx macrotis* (13).

This species has been reported previously from México, Guatemala, and Panamá, but this is the first record from the Yucatan Peninsula. Emballonurid bats are the major hosts for this chigger.

CHIGGER-HOST RELATIONSHIPS

A brief review of the chigger-host relationships seems appropriate. Many vertebrates were examined for ectoparasites, including most of the amphibians (20 species) and reptiles (67 species) listed by Duellman (1965), at least 105 birds of 60 genera (Klaas, 1968) and more than 375 mammals of seven orders, 42 genera and 52 species. Bats (18 genera, 21 species and 181 specimens) and rodents (14 genera, 19 species and 169 individuals) comprised most of the mammals examined and nearly all of the hosts.

Chiggers were not recovered from amphibians. The reptilian hosts, represented by 21 lizards of six species and four snakes of three species, had only the pest chigger, *Eutrombicula alfreddugesi.* There were 10 avian hosts of nine species, and eight of these birds were infested only by *E. alfreddugesi.* Chiggers of 26 species were recovered from 25 species of mammals, including one marsupial, one carnivore, 27 bats of 12 species, and 79 rodents of 11 species.

A total of 27 individuals of the 181 examined bats had chiggers and only four of these harbored two kinds of chiggers. Twelve species of chiggers were taken from the 12 species of bats. Some host selectivity seems to be present although most of the previously described chiggers are known from additional hosts.

Eighty-one of the 194 terrestrial mammals possessed chiggers and 37 of these had only one kind of chigger. Of the 44 individual hosts with two or more kinds of chiggers, 30 harbored two, 11 had three, two possessed four, and a climbing rat, *Ototylomys phyllotis,* had five species of chiggers.

Three kinds of rodents totaled 100 of the 169 individuals examined and 54 of the 79 rodents that harbored chiggers. Seven of 37 *Peromyscus yucatanicus* had chiggers, 24 of 35 *Heteromys gaumeri* were infested, and 23 of 28 *Ototylomys phyllotis* had larvae, and eight species of chiggers were recovered from each of these three kinds of hosts. The latter two kinds represent all but one of the hosts with three or more species of chiggers and 19 of the 30 hosts that harbored two species of chiggers.

The common pest chigger, *Eutrombicula alfreddugesi,* was abundant on terrestrial mammals, as 23 of the 81 chigger hosts were parasitized by these larvae. On rodents, the most abundant genus of chiggers was *Pseudoschoengastia,* which has four species on the Yucatan Peninsula. One or more of the four species were found on 51 of 79 rodents, and on 39 of the 44 hosts (89 per cent) with two or more species. At least one kind of *Pseudoschoengastia* was recorded from 22 of the 24 *Heteromys gaumeri* and from 19 of the 23 *Ototylomys phyllotis.* The most abundant species, *P. scitula,* represented by 180 larvae, was taken from 44 hosts of seven species of rodents, and was found on 20 of the 24 *H. gaumeri* and on 18 of the 23 *O. phyllotis.*

In summary, 26 species of chiggers, belonging to 15 genera, are reported from the Yucatan Peninsula. Chiggers were recovered from 143 individual vertebrates of 43 species. Reptiles harbored only *Eutrombicula alfreddugesi,* whereas birds had *E. alfreddugesi* and two other species of chiggers. All 26 kinds of chiggers were found on the mammals with 12 species on bats and the other 14 kinds on terrestrial mammals. The three most abundant and widespread chiggers were *E. alfreddugesi* (352 larvae), *P. scitula* (180 larvae) and *Leptotrombidium panamense* (92 specimens), all from terrestrial hosts.

List of Vertebrate Hosts and Their Chiggers from the Yucatan Peninsula, Mexico.

Reptilia

Sauria

Ameiva undulata gaigeae	*Eutrombicula alfreddugesi*
Anolis lemurinus bourgeaci	*Eutrombicula alfreddugesi*
Anolis limifrons rodriguezi	*Eutrombicula alfreddugesi*
Basiliscus vittatus	*Eutrombicula alfreddugesi*
Cnemidophorus augusticeps augusticeps	*Eutrombicula alfreddugesi*
Sceloporus chrysostictus	*Eutrombicula alfreddugesi*

Serpentes

Elaphe flavirufa phaescens	*Eutrombicula alfreddugesi*
Leptophis mexicanus mexicanus	*Eutrombicula alfreddugesi*
Spilotes pullatus mexicanus	*Eutrombicula alfreddugesi*

Aves

Ciccaba virgata centralis	*Eutrombicula alfreddugesi*
Cyanocorax yncas maya	*Eutrombicula alfreddugesi*
Dendrocincla homochroa homochroa	*Eutrombicula alfreddugesi*
Glaucidium brasilianum ridgwayi	*Eutrombicula alfreddugesi*
Ortalis vetula intermedia	*Fonsecia gurneyi*
Columba flavirostris flavirostris	*Leptotrombidium panamense*
Piaya cayana thermophila	*Eutrombicula alfreddugesi*
Psilorhinus morio	*Eutrombicula alfreddugesi*
Ramphocaenus rufiventris	*Eutrombicula alfreddugesi*

Mammalia

Marsupialia

Marmosa canescens canescens	*Eutrombicula alfreddugesi*

Chiroptera

Artibeus jamaicensis yucatanicus	*Whartonia nudosetosa*
	Tecomatlana vesperuginis
Carollia perspicillata azteca	*Whartonia nudosetosa*
Desmodus rotundus murinus	*Whartonia nudosetosa*
	Perates anophthalma
Glossophaga soricina leachii	*Whartonia nudosetosa*
	Euschoengastia desmodus
	Perissopalla precaria
Mimon cozumelae	*Whartonia nudosetosa*
	Euschoengastia desmodus
Mormoops megalophylla megalophylla	*Whartonia guerrerensis*
	Perissopalla lipoglena
Myotis nigricans extremus	*Tecomatlana alvarezi*
Natalus stramineus mexicanus	*Tecomatlana alvarezi*
Peropteryx macrotis macrotis	*Whartonia nudosetosa*
	Tecomatlana sandovali
Pteronotus davyi fulvus	*Wagenaaria similis*
Saccopteryx bilineata	*Tecomatlana saccopteryx*
Tadarida laticaudata yucantanica	*Tecomatlana yucatanica*

	Rodentia
Orthogeomys hispidus yucatanensis	*Leptotrombidium panamense*
	Pseudoschoengastia scitula
Heteromys gaumeri	*Odontacarus cayolargoensis*
	Cordiseta mexicana
	Ectonyx fusicornis
	Fonseccia gurneyi
	Leptotrombidium panamense
	Pseudoschoengastia brennani
	Pseudoschoengastia extrinseca
	Pseudoschoengastia scitula
Oryzomys melanotis megadon	*Eutrombicula alfreddugesi*
	Pseudoschoengastia scitula
Oryzomys melanotis yucatanensis	*Eutrombicula alfreddugesi*
Otonyctomys hatti	*Eutrombicula alfreddugesi*
Ototylomys phyllotis phyllotis	*Odontacarus cayolargoensis*
	Odontacarus chiapanensis
	Eutrombicula alfreddugesi
	Euschoengastoides wadei
	Fonseccia gurneyi
	Leptotrombidium panamense
	Pseudoschoengastia scitula
	Pseudoschoengastia extrinseca
Peromyscus leucopus castaneus	*Fonseccia gurneyi*
	Hoffmannina suriana
	Pseudoschoengastia scitula
Peromyscus yucatanicus	*Odontacarus cayolargoensis*
	Odontacarus chiapanensis
	Cordiseta mexicana
	Eutrombicula alfreddugesi
	Fonseccia gurneyi
	Hoffmannina suriana
	Pseudoschoengastia brennani
	Speleocola secunda
Rattus rattus	*Eutrombicula alfreddugesi*
Sciurus deppei vivax	*Eutrombicula alfreddugesi*
Sciurus yucatanensis baliolus	*Eutrombicula alfreddugesi*
	Hoffmannina suriana
Sigmodon hispidus microdon	*Odontacarus cayolargoensis*
	Eutrombicula alfreddugesi
	Eutrombicula batatas
	Leptotrombidium panamense
	Pseudoschoengastia scitula
	Carnivora
Nasua narica yucatanica	*Eutrombicula alfreddugesi*

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